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Journal of the Society of Arts.

FRIDAY, OCTOBER 1, 1858.

THE ECONOMIC USES OF NUTS AND SEEDS.

By P. L. Simmonds.

Anyone who passes through the bazaars and arcades, or notices the shop-windows of the metropolis, cannot but have been struck with the many new and ornamental applications of nuts and seeds which have come into use of late years, and which are greatly on the increase. There is yet, however, a very wide field open in the extensive productions of nature for profitable industry. The many applications of cameo and pearl shells to ornamental use, for studs, sleeve-links, breast-pins, &c., for pretty articles of bijouterie, or use for the boudoir and drawing-room table, and the large sale for such fancy articles, shows that a rich mine for the manufacturer and trader has been opened up. The fish-scale ornaments, from the hard transparent scales of the callipeva and other fish, first brought under notice by Chief-Justice Temple, in the columns of the Society's *Journal*, have now become a recognised trade, and brooches, bracelets, tiaras, &c., made of them, are largely vended in the galleries of the Crystal Palace. The turner, again, has profited largely by the extensive introduction of the vegetable ivory and coquilla nuts, which are applied to a great variety of useful and ornamental purposes.

In endeavouring to add to my private collection of industrial products the various applications which from time to time come before the public, I have been particularly struck with the new uses of nuts, seeds, &c., and as these form, perhaps, one of the most compact, ornamental, and popularly interesting sections of a museum, possibly a few collected notes respecting them may be useful.

In the great extension of this branch of trade we have one of the evidences of the utility of public exhibitions and economic or trade museums, as opening up suggestions and pointing out new materials to work upon. Our continental neighbours seem to be more ready and ingenious than ourselves in the application of nuts, seeds, and such small articles, to the purposes of decoration, and although, from their very cheapness, many of these ornaments are despised by our belles, yet none can deny their interest and beauty, and the taste in which they are worked up. The field is an exhaustless one, and many well-known ornamental nuts and seeds of India and South America have not yet made their appearance in this country. The most common applications of seeds and nuts at present are the betel nut, Job's tears, Mimosa seeds, the seeds of the wild liquorice, the Nicker seeds or Bonduc nuts, vegetable ivory, and coquilla nuts, &c.

The betel nut, the fruit of the *Areca Catechu* palm, loses with us its famous Eastern reputation as the popular narcotic masticatory. There the nut is sliced and used with pan, or the leaf of the betel pepper (*Chavica Betle*) and chunam, or shell-lime. The lime gives a deep orange or red colour to the colouring matter of the nut, and thus dyes the lips and tongue in the peculiar manner so common among the natives of India. All classes, male and female, chew it; and they allege that it strengthens the stomach, sweetens the breath, and preserves the teeth. In this country betel nut charcoal is often vended now by chemists as a tooth powder, but the imports of the nut being small, I very much question whether the greater part of that sold is really the produce of the betel nut. But it is the ornamental application of the nut with which I have here to deal.

The fruit (a nut) is yellow, oval, the size of an egg, inclosing an oily kernel, like a nutmeg, conical, rounded, pointed, and marked with white and reddish veins. When the outer coat is removed, these veins, or markings, have a very ornamental appearance. The nuts are either turned of a round shape, like beads, with striated lines, or flat, with ridges, like the petals of a flower, set with steel centre ornaments, and small intervening beads of the nut, and thus strung they form bracelets. In the Kew Museum there is a large walking-stick made of sliced betel nuts, fixed on a wire or centre.

A still more ornamental seed used for bracelets and rosaries, is the spherical corrugated seed of the *Elæocarpus ganitrus*, which are generally admired. In India they are known as Brahmin's beads, and when capped with silver they make very pretty ornaments.

The small round black seed of the Indian shot (*Canna Indica*) are often threaded as beads. But there is another use for them, and that is as a coffee substitute. Another round black seed, of a larger size is the kernel of the fruit of the *Sapindus Saponaria* (Linn.), of *S. marginatus* (Vahl), and other species, which is much used now for rosaries, necklaces, bracelets, and other ornaments. It is popularly known as the soap berry, for the aril which surrounds the seeds is used as soap in South America and India. The capsules or seed vessels are very acrid; they lather freely in water, and will cleanse more linen than sixty times their weight of soap; but in time, it is said, they corrode or burn the linen. This, however, requires confirmation.

The legumes of Acacia concinna (*Mimosa saponaria*, Roxburgh), form a considerable article of commerce in India. *Mimosa abstergens* fetches in the bazaars there about 1d. a pound, and if powdered 2d. a pound.

The Saponaceous principle, "Saponine," exists in many other seeds and roots, &c., as in the root of *Vaccaria vulgaris*, *Agrostemma Githago*, *Anigallis arvensis*, *Gypsophila Struthium* (the Egyptian soap root), various species of *Dianthus* and *Lychnis*, in the bark of *Quillaia saponaria* and *Silene inflata*.

The soap nuts are exceedingly hard and tough, and take a fine polish. The kernels of the small black nuts of *S. saponaria* are eaten in the West Indies, and deemed as palatable as the hazel nut or almond.

Dr. Sherwood mentions that the seeds of *S. marginatus* pounded with water, often put an end to the epileptic paroxysms, a small quantity being put into the patient's mouth.

The red seeds of the *Adenanthera pavonina*, a tree of the Mimosa tribe, often called red sandal wood in India, are much used for ornaments, weighing almost uniformly four grains; they are very generally employed by jewellers in the East as weights, so are the beautiful seeds of the wild liquorice (the *Abrus precatorius*), which are small bright red peas with a black spot. In India they are called goonch; very pretty rosaries, bracelets, and other trinkets are made of them.

The large seeds of the necklace tree of the West Indies (*Ormosia*, *coccinea*, and *dasycarpa*), of a brilliant red hue, with a black spot at one end, are now beginning to be used for sleeve-links and shirt studs. The Barricari seeds of Demerara (*Erythrina corallodendron*), a member of the kidney bean group, are also an ornamental seed.

The nuts of *Putranjiva Roxburghii*, called in Hindostan Jeeapootra, are strung by the natives round the necks of their children as an amulet to keep them in health.

The grey bead-like seed known under the popular name of Job's tears, are the stony fruit of a graminaceous plant (*Coix lachryma*). They are chiefly used in Catholic countries as beads for rosaries, but in times of scarcity they have served as food. They are also valued for some supposed medicinal qualities.

The large, bony, shining, grey, nearly globose seeds (*Guilandina Bonduc*, and *G. Bonducella*), called Nicker beans or Bonduc nuts, are used for bracelets and rosaries, and are very ornamental when set. They are very bitter, and have some medicinal properties, being considered emetic, and are used as a remedy for dropsy. The kernels of *G. Bonducella* are supposed by the native practitioners of India to possess powerful tonic virtues, and are esteemed as a febrifuge.

Cherry stones, and other fruit kernels, are often seen carved and highly ornamented, made into rosaries, &c., evidencing the patience and skill of the workman who has laboured on them.

The small brown seeds, something like apple pips, so commonly used, when strung thickly together, for bracelets, work-bags, nets for the hair, and other ornamental work, are the produce of *Desmanthus virgatus.* They are frequently dyed black for effect.

Cloves, threaded and interspersed with beads, are also used for bracelets, and are made into a variety of ornamental work, baskets, boxes, &c.

The vegetable ivory nut, sometimes called Corozo, the fruit of a South American palm, the *Phytelephas macrocarpa*, Ruiz and Pav., is now largely imported, sometimes to the extent of 150 tons a year, and they have been sold at the brokers' sales at 8s. or 10s. a thousand, but they fetch now about 40s. a thousand. They come chiefly from the Magdalena river. The applications of the nut under the hands of the turner are most varied. Umbrella knobs, the reels of spindles, pincushions, children's rings, small humming tops, thimbles, cases, and a variety of toys and little knick-knacks being made from it. The interior or albumen of the kernel is as white and almost as hard as ivory, and is in great demand for turning. It is of the same nature, though not of the same consistence, as the flour of the cereal grains, the aromatic substance of the nutmeg, and the pulp of the cocoa nut, which in other palms becomes more hardened. That of the date palm is quite as hard, if not harder, but it is neither large enough nor white enough to be of use to the turner.

The Coquilla nut is the popular and commercial name for the fruit of the *Attalea funifera* palm of Martius. Being excessively hard, beautifully mottled with dark and light brown, and capable of taking a very high polish, they are extensively used by turners for making the handles of bell-pulls, napkin-rings, the knobs of walking sticks and umbrellas, humming-tops, rosary cases, and such like. Several hundred thousand of these nuts are imported annually from Brazil, and sold at about 30s. the mille. The principal use of these nuts now is for waistcoat buttons, which are largely used at Birmingham, and they are coloured different tints to suit different cloths. The palm which bears these nuts also furnishes the strong piassam fibre of commerce, so largely used in making brushes and street-sweeping machines. The seeds of many of these palms are eaten by the natives of the countries in which they grow.

The seeds of the shreetaly or talipot palm (*Corypha umbraculifera*) are a species of vegetable ivory, capable of being turned into marbles or beads, and cut into button moulds, draughtmen, &c. They could be obtained in large quantities in Canara and other parts of India, but have not been introduced into England. A kind of flour is obtained from the nut. Another pretty palm nut is that of the Macaw (*Acrocomia sclerocarpa*, Mart). It is often turned and carved into small ornaments abroad. I have finger rings, sailors' rings for their neck ties, and other small articles made from them. On removing the outer coat, the nut has a beautiful black hue, which takes a fine polish, but they are too small to be commercially useful.

The uses of the coco-nut shells, from their familiarity, are now less appreciated. But we still see them carved and polished on the exterior and made into baskets and spoons, or mounted in silver as drinking goblets. They are also used for cups, elegantly carved sugar basins, lamps, skimmers, and by the Polynesians, as well as other natives, entire, for containing their water, having two holes in the summit. The largest nuts are chosen for this purpose, and are often seen highly polished, and of a fine black colour. The shells will also make good lamp-black, and, reduced to charcoal and pulverised, an excellent dentrifice. They are manufactured into beads for rosaries. The common ladle used over a great part of India and in the Brazils is formed of part of the shell, to which a long wooden handle is fixed. Particular virtues have been attributed to cups made of the shell of the coco-nut. They have been supposed to give an anti-apoplectic quality to intoxicating liquors.

"The double cocoa-nut (*Lodoicea sechillarium*) of Labillardière, was once held in great repute for all sorts of fanciful properties, from the ignorance which prevailed respecting its origin. The great men of the East formed of the shell precious vessels, cutting off a transverse slice, which constituted the lid, and in this they put their tobacco, betel lime, and whatever else they masticated, believing that these articles could never be contaminated by anything noxious. Water kept in it was considered to preserve those who drank of it from every complaint. The discovery of the Scychillio Islands, and the knowledge thence derived that these nuts grew upon trees, as other coco-nuts, soon reduced their value, and now probably, by the East Indians as by the Europeans, they are only sought as a matter of curiosity, or for domestic purposes.

"Of the nut are made vessels of different forms and uses. When preserved whole, and perforated in one or two places, the shell serves to carry water, and two of them are suspended from opposite ends of a stick. Some of these nuts hold six or eight pints. If divided into two between the lobes, each portion serves, according to its size and shape, for plates and dishes, or drinking-cups, these being valuable from their great strength and durability, so that this kind of utensil, in the Scychillio Islands, bears the name of *vaiselli de l'Isle Praslin.* Amongst other articles, shaving-dishes, black, beautifully polished, carved, and set in silver, are made from them."—*Seeman's Palms.*

The stony seeds of the Tucuma palm (*Astrocaryum Tucuma*, Mart.), are in Brazil turned into rings, "birros" or knitting pins, and other small articles for which bones are employed. The seeds are so hard that it is almost impossible to break them, except by a powerful blow with a large hammer. The kernel (albumen) is also very hard, nearly approaching to vegetable ivory. The kernel of the fruit of the doom palm is turned into beads for rosaries.

Several kinds of hard brown beans have lately been brought into use for making bracelets and other ornaments. Their plainness and monotony is varied by gilt or steel studs and settings, and small beads intermingled with ornamental pendants. The large horse-eye bean, the seed of a species of *Mucuna*, is really ornamental, and curious when mounted for bracelets. The large brown sword beans of *Entada Gigalobium* and *E. Pursaetha* are made into spoons, small coin cases, scent bottles, &c. They are used by the natives of India, under the name of "Gel," with soap berries for washing their hair.

The seeds of the pod of the Carob tree (*Ceratonia siliqua*), are said to be the original carat weights of the jewellers. It is strange that these seeds, and those of the tamarind, date, &c., have not been applied to some economic use with us.

The locust pods or carob beans, as they are termed, have come largely into use as a cattle food in this country, although they were first introduced at a high price in the chemists' shops as an improver of the voice. Vocalists were assured that like the sweets recommended in the extempore doggrel of a well-known and popular itinerant vendor, they would—

> "Clear your voice, and make you sing as well,
> As notes of music, or the nightingale."

In the Portuguese settlement of Ambrez, Africa, the seeds of the custard apple are strung upon thread as necklaces, and in the Kew Museum are rosaries made of olive seeds and stones. Immature oranges, turned and polished, make very pretty rosaries, having a pleasant odour, and they are also sold in chemist's shops as "issue peas."

Walnut shells are frequently mounted with hinges, &c., and used as the ornamental cases for miniature articles, such as scissors, thimbles, &c., and the Limerick gloves are packed in them, while jewels and other presents are often disguised in this rough case as an agreeable surprise. Calabashes, the hard rind or covering of the fruit of the *Crescentia Cujete*, are used for all kinds of domestic utensils in Africa and the West Indies. Cups and saucers, baskets and bowls, pepper and salt dishes, &c., of various sizes, plain or carved and ornamented, take the place of crockery, and are not so easily broken or destroyed. I have them in my collection in all sizes and styles. Many will stand the fire for cooking as well as an iron pot.

Under the name of bottle-gourds the hard and rough rind of the fruit of the *Lagenaria vulgaris*, cleared of the pulp and seeds, is used like the calabash for ready-made bowls and vessels for holding water. Snuff-boxes, again, are made by the Africans of *Oncoba spinosa* in Natal and Gaboon.

Having touched upon their purely ornamental applications, I may have a few words to say in a future number upon the edible uses of some of the ordinary nuts and seeds, and others that have been less generally utilized.

8, Winchester-street, Pimlico, Sept. 28.

BRITISH ASSOCIATION, LEEDS, 1858.

TRADE AND COMMERCE.

The following paper on "Trade and Commerce, the Auxiliaries of Civilisation and Commerce," by Mr. Bazley, of Manchester, was read before the Section of Economic Science and Statistics, on Thursday, the 23rd ult:—

Now, as of old, industry is the source whence proceed the supplies of the innumerable products of nature and of manufacturing art. The present age is distinguished not only by an amazing increase in the articles which result from the cultivation of the earth, and from the skill of the artisan, but new powers of production having been discovered, augmented supplies of all things necessary to the existence of the human family as well as of those things which adorn and gratify, yield their comforts and embellishments, and have consequently called for a correspondingly extended distribution. Happily these beneficial agents—production and distribution—have co-existently contributed to the visible and valuable results of modern industry, and this therefore is a pre-eminently practical age. Philosophers, theorists, and inventors have been prolific indicators of improvements; but till Watt and his successors combined the principles of science with the skill of the artisan, and demonstrated by the subjugation of manufacturing difficulties, and by the contrivance of mechanical agents, which became working benefactors, the fruits of scientific knowledge were only first sparingly partaken of. Stores of learning and of science have smouldered in the libraries of their possessors, great multitudes of people in every country have been subjected to the darkening influences of ignorance, though, in slow and uncertain progress, the elements of a new development were advancing; and the test of practical utility thus determines the merit of philosophic propositions, whilst the emanations of the untaught, whose experience as apt workmen has led them to invent and improve, are perfected by the superior application of mental skill, guided by true and enduring principles. Domestic and mere hand labours were the burthens borne alike in every large community, and in the households of the rustic cottage, or of the stately mansion—the distaff and spindle producing home-spun woollen or flaxen yarns; the shuttle with the hand loom and the knitting needle being the implements employed to supply the clothing wants of every family. About the middle of the eighteenth century, however, the whisperings of intelligence began to tell of magic wonders which water and steam power—with manufacturing appliances to arise from new mechanical contrivances—should produce, and then opened that remarkable era which called coals and metals from the mines to minister to the formation of a gigantic manufacturing system, when domestic industry was proved to be inadequate to provide for those new wants which increased knowledge and refined desires showed their possessors that they required, and which might be gratified with benefit to extending industry. Manufacturing establishments became signs of progress; employment and consumption equally increased; migrations of labourers to districts needing additional hands took place; wages were more extensively paid; expenditure from enlarged earnings fructified by fostering new demands for the necessaries of life, thereby widening the foundation on which the new structure of industry should be erected; and the application of mechanical power having led to a vast increase in all the productions which could contribute to the comforts of life, machinery was proved to be creative, and not destructive, of beneficial labour. The rise and progress of the cotton trade will probably best confirm and support these views, which are indeed applicable to every branch of national industry. The growth of cotton is indigenous in those countries which border on the tropical regions. From time immemorial cotton has been grown and manufactured in the East Indies; and no doubt 3,000 years ago the Hindoo wore garments made from this material, not dissimilar to the cotton clothing now supplied from places then unknown, and where the cotton plant cannot thrive, but which industry and machinery have rendered practically the home of this greatest of modern occupations. Asia and Africa were the earliest fields whence cotton was gathered, and though Turkey in Europe, Spain, the Isles of Greece, and the south of Italy, have in the middle ages grown cotton, for the United States of America was reserved its latest introduction, most extended cultivation, and vastly the largest production. Some 70 years ago the seed of cotton was first imported into America, and sown, and when its planter beheld with delight his few acres of ground white with their downy harvest, he exclaimed with foreboding alarm, "This cotton may be made into more stockings than the world needs," yet its value would not exceed £100; whilst, since then, in the very short period of its production in that country, so amazing had been its increase, that £40,000,000 stirling may be estimated as the worth of the last year's yield. Probably from the most remote ages, the arts of spining and weaving were practised by the human hand. In patriarchal times needlework was highly esteemed, and in every subsequent period this useful accomplishment has been possessed by women of the highest rank, and by those resident in courts, as also by the squaw of the rude Indian, and by the housewife of every country. But to modern efforts must be attributed, as exemplified in the cotton trade, those enormously large productions of the textile fabrics, whether of the plain and useful, or of the fanciful and ornamental which have placed alike in cottages and palaces comforts and decorations to which the ancients were strangers. In 1758 the imports of cotton and its consumption by domestic labour might be three millions of pounds weight for the entire year, but in the present year, a century afterwards, the quantity consumed will be one thousand millions of pounds, of which the United States supplies three-fifths, the other two fifths being obtained from the East Indies, South America, Egypt, and the West Indies. For the last year, by the return made by the Board of Trade, the exports of cotton manufactures, sent to every part of the world, amounted to upwards of £39,000,000 sterling; hence this large sum becomes the agent of payment to a corresponding extent for imports, but in thus largely aiding in procuring increased supplies of foreign products, whether in gold, silver, raw materials, food, wines, sugar, fruits, or luxuries of distant growth, which are received into the United Kingdom, there is the satisfaction that our cotton industry has contributed clothing comforts to the benefit alike of the savage and civilised in every region of the earth. In this current year the exports of cotton manufactures will perhaps amount to £40,000,000 value, and the portion left for home consumption may be £24,000,000, or equal to 17s. per head for the population of this country; but as the cotton trade of Great Britain is not half its magnitude in the entire world, including the domestic and semi-domestic manufacture, still extensively carried on in the East, the manufacture of the world at large cannot be less than the annual value of £140,000,000, and therefore this industry affords to the world's population three shillings worth each of cotton clothing, or represented in calico 14 yards per annum for every man, woman, and child in existence. Presuming the cotton industry of this country to amount to £64,000,000 in value for the current year, and the cost of the raw material to be £24,000,000, then the sum remaining for wages, interest of capital, rent, taxes, fuel, freight, carriage and other requisites, will be £40,000,000. The population employed in this trade exceed half-a million, and as every worker is said to be connected in his family with three non-workers, who depend upon the single worker for subsistence, two millions of people are therefore supported by it. Engineers, founders, machine makers, and other auxiliary traders employ vast numbers of well paid-workmen, who are constantly engaged and sustained at the cost of capital invested in the constructive department of the cotton trade; hence these further sources of support increase the total number of people dependent upon this extraordinary industry. But those mechanical artisans who are not directly visible as spinners and weavers, and whose labours cannot be measured by the immediate production of yarn and cloth, are essentially contributing services of greater importance than either; and as capital accumulated by the trade itself, and derived from other channels, has been constantly and progressively in the course of investment, the employment and consequent expenditure of that capital in wages cannot be overlooked, although it does not appear to be recorded in the form of exported or of home-consumed manufactures. Compared with the world's history, the cotton trade may be regarded as having only existed during a mere atom of time. The inventor of attenuating cotton by rollers, whether Wyatt or Arkwright is unknown, but the latter took out a patent for it, and for spinning upon the throstle, in 1767. Hargreaves, who invented the jenny by which the attenuation was effected only by elongation and recession, matured his machine about the same time, and the talented Crompton, whose contribution to the mule gave the greatest impulse to the trade, and whose invention now fills its vast factories, only effected the alliance of the throstle with the jenny in 1787, when he completed that machine of immense merit, giving mechanical life to the laborious and beneficial mule, which then entered upon its successful and profitable career. The total number of cotton spinning spindles in the United Kingdom may be now 30 millions, and in addition there are power-looms and other machines in very great numbers, thus warranting an assumption that 50 millions sterling have been invested in the machinery and buildings of this trade in this country alone; and if the capital of the auxiliary trades, as well as that requisite for carrying on this industry, be included, the total capital employed will exceed £100,000,000 sterling. If, however, Watt had not improved the steam-engine, and developed the dormant usefulness of mere vapour, a serious barrier to the progress of industry, aided by mechanical inventions, would have remained as a retarding obstacle; but in 1774 he was called from Scotland to Birmingham, where he began the construction of that engine which his partner, Boulton, told George III. produced the object of the love of kings—power. And as if to feed this infant industry, at this period cotton was first grown in the United States and thence supplied simultaneously when Crompton's triumphant discovery appeared. Viewing Lancashire as the chief seat of this industry, if we refer to the population of this county 100 years ago, we find it to have been about 300,000, whilst now it numbers 2,000,000 more, or 2,300,000, making an increase greatly in excess of any of the old trading and agricultural communities of this or of any other country. The individuals who migrated into this country did not leave behind them happier and better homes than they obtained by the change; they did not vacate places of greater profit; and they did not move from their old and parental abodes to accept from those who were establishing a new industry, either fewer comforts or lower wages than they had previously enjoyed. With the new trade of Lancashire, Liverpool became the port for the reception of its raw material and mercantile returns, and for the distribution of the superabundant goods which were produced, and thence shipped to every opening foreign market. Liverpool, in 1758, was little more than a bathing and fishing station; its tonnage then might be 100,000; but, having grown with the growth of the cotton trade, its tonnage for the current year may be stated at 5,000,000. The splendour of the docks, filled with ships loading and unloading, of the public buildings, and of the town itself, proclaims Liverpool to be a seaport of no secondary importance; and its attributes establish it as a representative of a vast industry, and the commercial purveyor of necessaries and comforts for great numbers of mankind at home and abroad. Camden relates that the southern and western parts of Lancashire were once a morass, without roads and facilities of communication; its agricultural condition generally being unproductive, the abodes of the labourers were miserable, and, in addition to great natural disadvantages, an expiring feudal system left the people as degraded as they were wretched. This county now, however, is filled with flourishing towns; it is intersected by roads, canals, and railways; its rivers have the safe conduct of bridges; its soil is cultivated alike to the advantage of its owners and to the teeming population which obtain a portion of their food from it: and its abundant mines supply that indispensable fuel which gives power to the modern engine of propulsion, and thence to the spindle and to the loom; to the locomotive; to the proud steamer which defies wind and wave; and which also warms the hearths of all. Manchester, as the chief manufacturing city of this county, has advanced in the full ratio of its increasing industry, with Liverpool and the other portions of the county. In 1758 the population of Manchester and its suburbs did not number 20,000, whilst 500,000 will at the present moment be no incorrect estimate; and this single fact must prove the potency of mechanical skill, and the success of manufacturing and mercantile energy there exerted. Extensive are the ramifications of the manufacture of cotton, and numerous are the places in which it has become the great support of labour. In addition to Lancashire, Cheshire, and Derbyshire, where large spinning and manufacturing concerns exist, there has been established in Scotland a branch of the trade of great importance; and in that portion of the United Kingdom the investments of capital are considerable, and the trade there affords profitable employment to multitudes of workpeople in almost every department of its industry. From north to south and from east to west in Great Britain are to be found seats of this manufacture. In many parts of Yorkshire cotton is spun; but in Bradford and other places cotton yarns and thread are extensively and advantageously blended with the wool of the sheep and of the alpaca, jointly producing most useful and beautiful fabrics. At Nottingham the lace trade has taken up its abode, whence it extends to Devonshire and to the Isle of Wight. Leicestershire possesses the hosiery trade; and thus from place to place cotton has wandered, as a benefactor and not as a vagrant, and has been manipulated according to the genius of the people who have seized hold of it, and to the demands and taste of the age. The beautiful art of printing calicoes and muslins is chiefly conducted in Lancashire, but in Scotland it is also a large and important branch of industry. About one-eighth of the cotton spun and manufactured in the United Kingdom is devoted to this portion of the trade. The workpeople employed in printing are very numerous, and are exceedingly well paid. To the art of printing the cotton trade and the consumers of its manufactures are greatly indebted. No goods produced combine the beauty of coloured decoration with excellence of fabric, at so small a cost, as do printed cottons. Depending, as this country now does, upon cotton as an article by which labour and capital are most extensively sustained, as the leading commodity of import and of export, as affording more employment than any other material of manufacture, having involved in it the welfare and happiness of greater numbers than any other single industry, and contributing by the payment of direct and indirect taxes most essentially to the national revenue —may not the question be asked whether this foreign raw material be so efficiently supplied as to prevent those fearful disasters which would arise to the labouring, trading, and mercantile classes, if by storm or tempest, by revolt, or by the calamity of war, this vital element of prosperity could not continue to be procured from its present field of greatest growth? To the energy of the planters of the United States this industry is more indebted than to the cultivators of land in any other country; yet the States possess only an insignificant portion of ground capable of growing cotton as compared with the vast tracts of excellent soil in suitable climates which are under the dominion of this country. Beyond the possessions of Great Britain are equally extensive fields in which cotton could be cultivated and produced. Africa and Asia could grow more cotton than the most sanguine can contemplate the demand of the whole world will ever require, and to extend its production in those two quarters of the globe would be at the same time to extend civilisation, and to diffuse the comforts of life. Workpeople, manufacturers, merchants, statesmen, and philanthropists, have all the deepest interest in this vital question, but which hitherto has been shrouded in almost fatal apathy. Cotton, sheeps' wool, flax, and silk are alike required in larger quantities to supply the calls of industry, and to contribute to the manufacture of goods for which the wants of mankind induce them to crave; and a true benefactor to industry will he be who promotes the growth of those raw materials, without an increase of which trade and commerce will languish; but in truth their scarcity and consequent dearness of price will define and limit the extent of manufacturing industry in every branch; therefore, a great duty devolves upon all who wish prosperity to be perpetuated, and who desire the continuance of well-rewarded labour. At home and abroad the wonder is that the British East and West Indies have not supplied the largest portion of the cotton needed in this country; but the lust of conquest in the rulers of the former dependency, and the prostrate condition of its population, arising from exactions which even few conquered nations have submitted to, have tended to retard the extension of the cultivation of cotton, and of other valuable products such as its soil and climate would permit to be cultivated with advantage; and in the latter, the West India islands, deadly protection misdirected the energies of their planters, and when the legislature emancipated the negro no provision was made for the introduction of free labour; wherefore misgovernment is responsible for much of the unproductiveness of those portions of the British empire. Roused. however, by the salutary influences of public opinion, the Legislature of our country has given to the East Indies a new existence. No intermediate spoiler will hereafter prevent the Queen and a direct executive from developing the resources of India. Abounding in the elements of prosperity, the soil, climate, and people afford pledges of success, if roads, canals, railways, telegraphs, and the other agencies of progress be introduced; but above all, if that beneficent principle by which nations can only advance with enduring certainty be recognised in the administration of pure and untarnished justice; the future of our two hundred millions of fellow-subjects will be identified with their amplest productions and the largest commerce of the world; with civilisation untainted by the errors of superstition—a false philosophy, and our common Christianity will be received and embraced as the triumph of Britain's gracious rule. An enlightened and just policy applied to every British colony will yield the benefits of an extended commerce, blessing, like charity, those who give and those who receive, whether at home or in the foreign dependencies of Great Britain. Laws to be respected and obeyed must be just, and no system of polity can be permanent unless the material prosperity and welfare of the people under it be secured. For a moment contrast the course of industry in Lancashire, the great manufacturing and consuming district of this very cotton, with the East Indies, the country pre-eminently capable of supplying it in overwhelming quantities. In the one case from the battle of Plassy, 100 years ago, we have witnessed annexation upon annexation, oppression in taxes and rents, roadless and impassable territorial possessions, agriculture retarded, irrigation and public works discountenanced, justice frustrated, Juggernaut and the suttee long upheld to the perpetuation of superstition: and, finally, this ruling policy bore the fruit of which it had sown the seed—mutiny and its consequent horrors. In the other case, Lancashire during the same period has increased to an untold extent in the value of its landed and other property, in the numbers of its inhabitants, in its services to the State; and it has surmounted difficulties, natural, commercial, and govermental, thereby acquiring prosperity unprecedented. Of the moral and educational state of the workers in cotton manufactories it may be asserted that they are less the victims of vice and ignorance than are many of the labouring classes in some semi-domestic and other trades. No doubt the educational qualification which the law requires for children employed in factories is of great benefit to them; but this imperfect system of partial national education is invidious as applied only to children who labour in factories. Could, however, all the children in the United Kingdom derive the instruction afforded to those of them whose destiny places them in mills and manufactories, fewer would be the evils which are indentified with ignorance. On this occasion time cannot be allowed to illustrate by other details the state and progress of the cotton trade; but the multitudinous advantages which have proceeded from this industry are in truth kindred representations of the benefits which have been derived from the great manufacturing and mercantile organisation of this country. In the manipulations of wool, flax, silk, and of all the metals are to be found proofs as important as those claimed for cotton that the modern manufacturing system by which the comforts of life are indefinitely increased, is, under a wise Providence, raising the moral, mental, and social condition of people everywhere, and is placing the necessaries and elegancies of life within the grasp of countless classes, to whose predecessors such comforts were unknown. Evidence has now been adduced that the sustaining, clothing, and material comforts of life have been vastly increased, whilst literature, advancing with the age, has contributed to the mental elevation of the whole community. Under the old feudal system of the country the labouring classes had inflicted upon them privations and indignities which now they are no longer called upon to endure; they maintain their personal independence; and where, by mental attainments, industry, frugality, honesty, and perseverance, they strive for fortune and distinction, no hindrance to their advancement exists. That the improved cultivation of the earth and mechanical applications to manufactures have added immeasurably to the ability of all to consume more largely, than at any former period of the surrounding plenty, created by intelligent industry, none will deny; but if a link in the chain of that plenty which now exists be required, look to the burthens of abundance freighted on the fleets of merchant ships, which traverse every sea, and which the wind and wave send as messengers of plenty and peace to the people of every land; see our shores fringed with the sails of every nation; see our old roads still loaded with the fruits of the earth and of toil; canals, their slow rivals, engaged in the performance of similar labours; then mark the progress of steam's rapid car, bearing on the railway those precious loads of human life, and that traffic which cannot wait for the locomotion of olden times; and, finally, see that despatch of weal or woe which heaven's lightning, made to drudge, sends from man to man, and bold will be the sceptic who disbelieves in the ameliorations of this age, prolific in practical benefits. Acknowledging, therefore, the existence of superabundance in everything which can promote the comfort and happiness of mankind, is its distribution directed to the reward of those who toil and spin? In every age of the world, rich and poor have existed, but the latter in modern times have diminished in proportion to the visible increase of the former; and when nature and art are in beneficial alliance, increasing the store of material comforts, these being produced beyond the possible consumption of the affluent, their surplus can only be absorbed by those whose reasonable wants need and deserve to be supplied; and, therefore, the rich who have always had the means of procuring enough, and requiring little of the increase, the masses of our fellow-creatures, who earn wages by their labour, are in reality the great buyers and consumers of the bounties which their labour provides. In days of yore, when manufacturers had no existence here, the rich procured their foreign luxuries by unholy traffic, and Britain's children were stolen and sold to bondage; yet then, as now, the wise and beautiful were amongst the daughters of our race, and from the expatriated of those their sprang a Queen who graced the throne of the great Constantine; but in these better days no tender ties are severed by us to procure wares which in our time honest labour buys. Later in the progress of early traffic our nobles obtained their Genoa velvets and their Damascus swords by the exchange of that corn which their estates grew, but which their hungry dependents could have devoured; though now neither feudal nor fiscal violence need disturb the self-adjusting commerce of nations, nor the laws of exchange interfere with the relative values of those commodities which men give and take from their fellow-men. With these facts illustrative of the power, utility, benefit, and enlightening influences of trade and commerce, may not the conclusion be sanctioned that industry and exchange are amongst the true auxiliaries of civilisation and comfort. When therefore we see our globe girt with the intelligence which intercourse diffuses; when the soils and climates of the earth are devoted to the production of materials which are indispensable to the industry and comfort of mankind; when genius and talent, guided by philosophy, prepare for the most effective application to useful purposes those materials; and when patient and enduring labour at home manipulates the gifts of nature grown in distant lands—can the good and practical result of man's exertions be otherwise than beneficial to his fellows of every country; but when the telegraph, steam, and other mechanical wonders are rendered subservient to the benefit of man, no other than grateful homage to the ever present though invisible Power which sustains the universe can animate those who would still advance and elevate the intellectual and physical condition of their species. On the recent visit of our gracious Queen to her loyal town of Leeds, the progress of our town and the pecuniary and accumulative prospects of commerce were referred to, and in those visions of brighter days and developments which were then anticipated may the gladdening aspiration predominate that moral and mental attainments shall never be subordinate to mere material acquisitions. And may the British Association in its migrations scatter the seeds of progressive and practical philosophy, aiding by its wisdom, correcting by its knowledge, and encouraging improvements by its discerning approbation, till the light of truth banish the darkness of error and ignorance; and thus may an enduring alliance of the advantages of science be cemented with the practical benefits of trade and commerce.

TONNAGE REGISTRATION.

The Report of the Committee appointed by the British Association to inquire into this subject, was brought before Section G. at Leeds, when the following resolution was passed:—

"That the Report of the Shipping Committee be sent to the Council, accompanied by such a statement as the members of the Shipping Committee who declined to act on that Committee may think fit to prepare. Such report and statement to be dealt with as the Council may think fit."

Under these circumstances it has been thought right not to publish the Report at present.

CONCERNING JAMES WATT.

The copy of an original letter from James Watt to a Mr. Geo. Mackay, on the subject of the steam-engine, mill, and machinery, subsequently erected for the Governor and Company of the British Cast Plate Glass Manufacturers, at the head of which was Sir Herbert Mackworth, the locale being Ravenhead, near Prescot, in the County of Lancaster, and the rough draught of agreement, dated Sept. 1, 1788, just seventy years ago, have been shown to the Secretary, who has received permission to publish the following particulars. The letter is given entire:—

Birm^{m} Oct^{r} 20th 1788.

Mr. Geo. Mackay,
Dear Sir,

We have made out plans for your Engine house & Mill House, which will be sent of by Tuesday or Wednesday. We have not been yet able to settle the Machinery, but have settled it so far as relates to the millhouse. The method propos^{d} with the long rod moving the whole length of the house did not please, we have therefore provided for a long shaft as propos'd first. I have also some reason to think the oval motion may not answer but have made the house that it will answer for either way. You will see that I have propos'd the polishing shop to be next to the road wall and the grinding shop to be next to the Salt Houses, with the Engine house as near the edge of the bank as you shall judge convenient. and the angular piece left may serve for a coal yard.—As for the method of Polishing it is far from being settled. I think you will do well to build the grinding shop and Engine house first and set that agoing before the other is begun, by which means we will be enabled to try experiments on the proper means of polishing, before we lay a brick of the polishing shop. you will please advise whether you begin building this season or delay till the spring. I am going from home for a week but shall write again when I return. I remain Dear Sir

Your Obed^{t} Hum^{e} Serv^{t}
JAMES WATT.

It appears by this letter that the whole arrangements of the Glass Works was left to Mr. Watt, for the agreement was entered into about a month before the date of this letter, when he had still to settle how glass might best be polished by a course of experiments, thus clearly proving the great trust that was placed in his skill, and his great caution, which warranted the trust in him. A subsequent note is as follows:—

"Messrs. Boulton and Watt present their compliments to Mr. Black, and have sent the deeds of agreement betwixt the Glass Company and them for the Company's seal, and have advised Sir Herbert Mackworth, Bart.

"Birmingham, 7th October, 1788."

By the rough draught of the agreement it appears that a licence was given to the Company to erect and use one of his engines capable of raising 47,000 pounds weight ten feet high in one minute, being estimated as equal to 14 horses power, for the remainder of the term of 25 years, granted by Act of Parliament in consideration of an annual payment of £70, and the said engine was not to be used at any other place than Ravenhead, or within ten miles distance therefrom.

There is an endorsement on the margin of the rough draught thus:—

"1788
Sept^{r} 24
Approved H. M."

being the initials of Sir Herbert Mackworth.

There is also a curious annotation in it, a direction to the clerks,—

"The parchment to be turned up 2 inches."

Amongst the documents is another note, apparently for the purpose of formality in business, probably from the solicitor of Messrs. Boulton and Watt.

Birmingham, 7th October, 1788.

Sir,—By the coach this evening will be sent to Mr. Black the deeds of agreement betwixt the Governor and Glass Company and Messrs. Boulton and Watt, executed by the latter gentlemen. When the Company's seal is put to them, one is desired to be returned.

Sir, your most humble Servant,
JOHN SOUTHERN.

Sir Herbert Mackworth, Bart.

Accompanying the papers is a rude specification of the boiler, dated 17th October, 1788. "The man-hole is oval, 18 inches by 14, without a lid; the bottom is to be made of copper, 12 lbs. to ye square foot; the sides of copper, 9 lbs. to ye square foot; and ye top of copper, 6 lbs. to ye square foot." 6ft. 6in. in diameter, 7ft. 6in. in height, 6in. flat on edge, with the bottom to rest on the brickwork, and a hollow rim of 9in. along the bottom to catch the heat.

"Dimensions, both as to diameter and height, and also as to thickness of ye metal, to be strictly adhered to."

"N.B.—Ye top is half a globe."

Nothing is said about length. The thickness of metal is rather startling at the present day; the bottom about $\frac{1}{4}$ inch, the sides $\frac{3}{16}$ inch, and the top about $\frac{1}{8}$ inch. But working pressures then were only 7 lbs. per square inch; some difference from our modern locomotive pressures at 120 lbs. per inch. The wooden cask, with hoops, found in one of Mr. Watt's patents, for a locomotive boiler, with a fire in its belly, though a very original idea, would scarcely fulfil our modern conditions.

The first of Mr. Watt's engines to produce rotary motion was erected in 1787. The engine, the subject of the present article, appears to have been his second, and his profit for royalty was £5 per horse-power per annum for 25 years; thus, £1750 was the royalty on his second engine, distributed over a period of 25 years. It seems now a large payment for a 14-horse engine, but it is doubtful if our progress as a nation would have been hastened so rapidly had the legislature grudged the reward to our great inventor, as did his competitors after the fact was achieved.

It may be added that the above machinery for polishing glass has been in use continuously from 1788 to the present date, almost without alteration. New machinery is now being erected.

ELECTRIC TELEGRAPHS.

The Vienna correspondent of the *Times*, under date of the 27th instant, relates the following occurrence:—

"An accident which happened a few days ago at Zara (capital of Dalmatia, on the coast of the Adriatic sea) may, perhaps, serve as a warning to persons who are employed in repairing telegraphic wires. After a violent thunder-storm, accompanied by heavy rain, some workmen attempted to raise two or three posts which had been thrown down. Two of the men took hold of the wire, which was not broken, in order to assist their comrades, but hardly had they touched it when they uttered piercing screams. The one man staggered, and fell to rise no more, but the other remained on his legs. A third man, who was struck by his falling comrade on the shoulder, complained of violent pains in the head, singing in the ears, and indistinct vision. The hands of the two men who had taken hold of the metal were much burnt, and the one who escaped with his life stated, that as soon as he touched the wire he suffered 'indescribable' pains in the head and body."

SOUTH KENSINGTON MUSEUM.

During the week ending 25th Sept., 1858, the visitors have been as follows:—On Monday, Tuesday, and Saturday (free days), 4,150; on Monday and Tuesday (free evenings), 5,532. On the three Students' days (admission to the public 6d.), 619; one Students' evening, Wednesday, 96. Total, 10,397. From the opening of the Museum, 612,548.

Proceedings of Institutions.

◆

Glasgow.—The thirty-fifth annual report of the Mechanics' Institution for the session 1857-58 speaks of its increasing usefulness and prosperity. Last year the Institution received a grant of £200 from the Ferguson bequest fund. Of this sum £150 was applied toward payment of the debt secured over the property, and the remainder was voted for the purchase of books for the Library. The number of students enrolled in the classes of the Institution was 887, being 140 above that of the previous session. In addition to the usual courses of instruction, morning and evening French classes were instituted and very successfully conducted. The abstract of the treasurer's accounts shows a balance of £70, remaining available for the objects of the Institution. The report then enumerates some presents which have been made to the Institution, and then proceeds to give an account of the various branches of instruction which are taught there. In chemistry, the teacher, Dr. Wallace, devoted the course to the consideration of the fundamental principles of this important branch of natural science, together with the study of the chemical history of the non-metallic elements and their most important compounds. Monthly examinations were held, for the purpose of ascertaining the progress made by the students and of awarding the Prizes. The Lecturer has expressed great satisfaction with the diligence and progress of the students. The course on natural philosophy, by Dr. Thos. Johnston, consisted of a series of lectures on the leading heads of mechanical philosophy, illustrated occasionally by experimental exercises. The capabilities of the students were tested, both by the writing of essays and verbal answers to questions proposed from time to time by the lecturer, on the subjects taught. In the class for music, the teacher, Mr. Barr, was occupied during the first half of the session principally in giving the students a through knowledge of the various characters used in music, and of singing at sight, in which very satisfactory progress was attained. The second half of the session was taken up in practising the singing of psalm tunes, glees, and popular songs. The lecturer was enabled to make advances with the theory of harmony to a greater extent than on any former occasion in the Institution, owing to a number of the students having attended during a previous session. The elocution class was conducted by Mr. G. M. Ferrier, L.R.C.S., and although this gentleman had the disadvantage of commencing late in the session, and of this being his first appearance in the Institution, he obtained a large class. The course consisted of twelve lectures. The principles of rhetorical reading were explained. Pronunciation and the different kinds of emphasis, as applied to expressive reading, were illustrated by vocal exercises. The French classes, conducted by Mons. C. A. Chardenal, B.A., were in three divisions,—two in the morning and one in the evening. The number of tickets sold was 128. The books used for beginners were "Hall's first and second courses of French Lessons," which were gone through by both classes of beginners. For the advanced class, which met at eight o'clock in the morning, the half of "Holt's Genius of the French Language" was gone over. The teacher recommends this work, for its excellence in French idioms and conversational exercises. He was well pleased with the attention and progress of all the pupils. The classes conducted by Mr. H. M. Ashcroft, for instruction in the higher branches of Arithmetic and in Mathematics, have increased considerably, 164 tickets having been sold. The students in this department were arranged into junior, middle, and senior classes. The junior class was occupied with the study of the first and third books of Euclid's elements; Algebra—as far as simple equations with one unknown quantity; Mensuration of superficies, and some of the rules of Arithmetic. The middle class studied the first and third books of Euclid minutely, the second algebraically, the fourth cursorily; Thompson's supplement to the fifth, some of the more important propositions of the sixth; plane Trigonometry; Mensuration of heights and distances, with the use of logarithms; Mensuration of surfaces and solids, and most of the rules of Arithmetic, from proportion onwards. The senior class studied: In Algebra,—all the subjects treated of in Montgomerie's Algebra: In Mensuration,—surfaces and solids, and some of the conic sections: In Euclid,—the six books, (Dr. Thomson's supplement to the fifth being used instead of the ordinary fifth book): In Trigonometry,—the analytical investigation of the formulæ for the different cases, and for the computation of tables of sines, tangents, secants, and others; and the application of these formulæ, simplified by logarithms, to the solution of various problems in navigation and mensuration of heights and distances: In the calculus,—the differentiation of Algebraic functions, maxima and minima, equations of straight and curve lines, and the elementary rules of the integral calculus. Upon all those subjects, numerous exercises were prescribed, and written solutions of them handed in weekly. With few exceptions, the attendance of the students upon the different classes was exceedingly regular, and the diligence and progress of all were highly satisfactory. The class for mechanical drawing, under Mr. Robert Harvey, has greatly increased. The pupils were chiefly engineers and tradesmen of mechanical professions. Mr. Harvey delivered his usual lectures on the more important details of the steam engine and applied mechanics, which were illustrated by a large collection of diagrams, and by models from the museum of the Institution. In the class for Drawing, Painting, and Perspective, conducted by Mr. A. D. Robertson, beginners were instructed in geometrical and elementary drawing of ornaments, flowers, figures, &c., having the general principles of perspective and the characteristic differences of Greek, Roman, and Gothic architecture and decorations explained to them. The students of the class for the study of trees and landscapes have made the most satisfactory progress, and those of the architectural advanced class have given the utmost satisfaction —the subjects of study being the classic, Doric, Ionic, and Corinthian orders. The students who studied perspective have shown an intimate and thorough knowledge of this most essential branch of art. The Botany class, under Mr. Roger Hennedy, consisted of 48 members. This interesting branch of natural science was highly appreciated by all the students. Excursions were made to various localities, thus giving the students opportunities of examining an extensive variety of plants and flowers with pleasure. The meetings of the Mutual Instruction Class have been held once a week. The debates and essays are, under certain rules, conducted by the students, without the interference of the Directors. The essays and subjects for debate amount to 34, and 22 students are engaged as principles. In the classes under the charge of Mr. Craig, the number of pupils and students has been from 1st May, 1857, to 14th April, 1858,—in the public day classes, 187; private day classes, 29; in the grammar and logic evening class, 176; in the arithmetic and book-keeping class, 204; and in the Phonography class, conducted by Mr. Stevenson, 58. The directors have lately purchased a considerable number of books, on science, art, and literature—these books have been placed in the library, along with those received from donors; the number of volumes amount to 6,300.

PORTSEA (WATT INSTITUTE).—On Thursday evening, the 23rd September, the members of the Portsea Watt Institute assembled in the Society's Hall to do honour to the two young men connected with that Institution who distinguished themselves in the late Society of Arts examinations, and who were then to receive the Certificates of Merit given to successful candidates by that Society. A tea was provided by the Committee of the Watt Institute, the more important business of the evening following.—W. HAMILTON, Esq., Paymaster of H.M.S. Excellent, President of the Philosophical Society, presided, and representatives of the three local institutions, in connection with the Society of Arts, were present. The CHAIRMAN said they were met for the very interesting purpose of congratulating on their success the two candidates from the Watt Institute who had received certificates from the Society of Arts, and whom he had great pleasure in introducing to their notice. The gentleman on his right (Mr. Wicker) succeeded in obtaining the first prize, and he (Mr. Hamilton) was happy to say that he had the good fortune to be in London, and to be present at the public dinner given to commemorate the meeting of the Society of Arts. The Earl of Carlisle was in the chair, and he felt exceedingly gratified at the manner in which that nobleman brought Mr. Wicker before the notice of that meeting. He was sure that Mr. Wicker would recall that circumstance of his life with the greatest pride and interest, as long as he lived. But if he felt gratified on that occasion when he was brought to the notice merely of an assemblage of gentlemen, he was sure that gratification would be doubled when he saw so many bright and pretty eyes expressing their approbation. He was sure he should only vex them if he detained them with any remarks on the advantages of education; he would, therefore, do no more than offer to the gentleman on his right the sincere and hearty congratulations of the company present, for the success which they had achieved in that high and honourable examination which they had been called upon to pass, and express their sincere and heartfelt wishes that the bright example they had furnished might inspire the minds of many of their fellow members to imitate their example.—The Rev. Professor MAIN, of H.M. dockyard, said, it had fallen to his lot, as Chairman of the Local Board of Examiners, to hand over to the successful candidates before them the certificates of merit so honourably acquired, and he did hope that their example would stimulate others who were coming on. They had furnished two candidates this year, both of whom were successful, and were a credit not only to the Watt Institute, but also to the town to which they belonged, and he hoped their example would be followed by many others not only of that Institution but also of other kindred Societies in the borough, and that

Portsmouth would still sustain the name which she enjoyed in common with other towns. The duty of examining gave them some little trouble, but he could assure the meeting they did it with pleasure, because they had a desire for the welfare of those around them, and if the numbers increased ten or twentyfold they would consider the labour required on their parts for the preliminary examinations well bestowed. He expressed the pleasure it afforded him to present the certificates which had been so honourably earned by Mr. Wicker. The first was the first of the three degrees of merit for arithmetic, algebra, and mensuration. In addition to this certificate, for his proficiency in arithmetic he received £5, for his proficiency in algebra, £5, for his proficiency in mensuration, £5. The second certificate was the second of the three degrees of merit in geometry, statics, dynamics, hydrostatics, and practical mechanics. The third certificate was the third of the three degrees of merit for trigonometry. To obtain these, Mr. Wicker must have devoted to his studies that time which others spent in what they considered to be a more agreeable manner, and he must have exercised considerable self-denial in that respect. He had great pleasure in offering him his congratulations. Addressing himself to Mr. Smith, Professor Main said he had also the pleasant task of handing him two certificates, the first being the second of the three degrees of merit in geometry and trigonometry, and the second, the third of the three degrees of merit in arithmetic, mensuration, statics, dynamics, and hydrostatics. He hoped this would stimulate him to further exertions, and he had much pleasure in offering to him also his congratulations.—Mr. WICKER on rising was received with much applause. He said that if he were to receive these certificates without any acknowledgment, they would think him unmanly and ungrateful, yet when he informed them that this was his first appearance in public, they must excuse the embarrassment he must necessarily feel. He had great pleasure in receiving the certificates at the hands of Mr. Main, and he hoped that he and Mr. Smith would not be the last to whom certificates would be awarded in this place, but that in each succeeding year more and more candidates would be successful in the Society of Arts Examinations. He felt himself unworthy of the honour they had done him that evening in giving him such a hearty welcome, and as he did not wish to forfeit their favour by a long speech, he would only express to them his sincere thanks for the same.—Mr. SMITH was also received with much applause. He said he tendered to them his grateful thanks for the encouragement that he and Mr. Wicker had received from them that evening, and to those of the same age as himself who had an inclination to present themselves at the examinations, he would say that he believed the name of the examination to be its most difficult part; if they would only apply themselves to study with earnestness and perseverance, and if they would give their time and trouble to prepare for these examinations there was no doubt they would find themselves in the position of Mr. Wicker, and obtain similar high certificates.—The Rev. H. HAWKES proposed a resolution to the effect that the meeting expressed its cordial good-will for the Society of Arts, and its approbation of the exertions it was making to promote the free diffusion of useful knowledge, in order to stimulate young men to self-education. He expressed his gratification at the successful results of the labours of the young men before the meeting and his cordial approval of the work undertaken by the Society of Arts. He more especially adverted to the fact that prizes had been gained by young women at the recent examinations, and dwelling upon the influence of women in their several relationships, in forming the character of men, showed how it was important that they, too, should be educated.—Mr. SPENCE, in seconding the proposition, entered into details with reference to the Watt Institute. After describing the cause which led to the establishment of that institution in 1848 by the factory operatives, he described, from a prospectus which accidentally fell into his hand a few hours before the meeting, the state of the institution in 1849. Its classes at that time were very flourishing; the drawing class numbered 15 members; the reading class, 9; arithmetic, 20; writing, 24; natural philosophy, 18; algebra and geometry, 16; junior steam class, 20; senior ditto, 20, and singing class 26. Mr. Spence also briefly traced the work of that society since that year, and stated that it was still pursuing its labours in the same spirit. After stating that the financial condition of the Society was very encouraging, there being a balance in the hands of the treasurer, Mr. Spence entered into various details to show the importance and the fruits of unflagging industry in the work of self improvement, and made other remarks to encourage those who were working like Mr. Wicker and Mr. Smith.—Mr. UBSDELL spoke to the sentiment: "The Fine Arts, may they become universal." Mr. Ubsdell briefly detailed the benefit arising from the cultivation of the Fine Arts, the recent rapid strides of our countrymen in this direction, and the opportunity afforded by the Athenæum classes conducted by Mr. Cunliffe, for students to obtain that instruction which was necessary to enable them to compete with credit at the Society's examinations. He expressed himself willing to give every assistance for the promotion of the object in view, and urged upon parents and guardians, and the youth of the borough, the importance of taking advantage of the facilities thus offered them for the acquirement of a knowledge of the Fine Arts.—W. RAWSON Esq., of H.M. dockyard, expressed the great pleasure he felt at being present on that occasion, one of the successful candidates having been for 8 or 9 years to a certain extent under his charge, and the other for a period of 5 or 6 years. He perfectly coincided with Professor Main not only in his congratulations to the young men before them and to the institution with which they were connected, but also in his congratulations to the town to which they belonged. But these were not the only prizes Portsmouth had carried off. There were in the town two men who had gained the highest mathematical honours in the Universities. One was Professor Main, and the other Mr. Besant, both of whom had reached the high and noble position of Senior Wrangler of Cambridge University. Others, too, who acknowledged Portsmouth as their birth-place, had obtained distinguished honours. It was therefore his fervent desire that the success which had attended the mental exertions put forth by the two young men before them, might influence them in all their after-life, and that it might induce others to follow in their footsteps. Mr. Rawson then said a few words on the sentiment, "The memory of James Watt," showing the nature of his great work, and the connection between him and other great men of our country, and concluded by pointing out the only way by which success could be ensured in the pursuit of knowledge.—The Rev. W. YOUNG spoke on the sentiment, "The education of the young, may it become universal, and based on broad and sound principles, common to all sects and parties."—Mr. CHARLES MAXWELL gave an interesting and humorous *résumé* of the life and writings of Thomas Hood, with quotations from the latter; and a vote of thanks having been given, which was duly acknowledged, the meeting separated.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette*, *Sept*. 17, 1858.]

Dated 7th September, 1858.

2025. G. Larsonnier and A. Blanche, Paris—Imp. in block-printing by hand on tissues, paper, or other suitable fabrics.

Dated 8th September, 1858.

2027. B. Hockin, Gateshead Iron Works, Gateshead-upon-Tyne—Apparatus for repairing and fitting dock-gates and their machinery.

2029. J. O. Butler, Kirkstall Forge, near Leeds—Imp. in weighing cranes. (A com.)

2031. A. Lamb, Southampton, and J. White, Cowes—Imp. in life-boats.

2033. C. Bartholomew, Rotherham, and J. Bell, Swinton—Imp. in pistons and safety-valve levers of steam and other engines.

2035. J. U. Faessler Petzi, Lyons, France—An improved process for the boiling off of tussah silks or wild silks.

2037. A. M. Peters, Edinburgh—Imp. in apparatus for regulating the flow or passage of fluids.

[*From Gazette, Sept.* 24, 1858.]

Dated 14th July, 1858.

1578. E. J. Maumené and L. B. Jaunay, Reims, France—An improved method of, and apparatus for, the production of sparkling wines.

Dated 24th July, 1858.

1673. H. Wikoff, Holly-lodge, Kensington gore—An improved aperient medicine to be used in the shape of a biscuit, cake, or sweetmeat. (A com.)

Dated 29th July, 1858.

1712. A. Gallard, 58, Aldersgate-street.—A new system of trusses. (A com.)

Dated 14th August, 1858.

1864. L. A. Forot, 2, Rue Sainte Appoline, Paris—A new mode of ornamenting fabrics, and in the apparatus connected therewith.

Dated 21st August, 1858.

1903. M. Benson, Craven-street, Strand—Improved apparatus for generating steam. (A com.)

Dated 23rd August, 1858.

1912. C. Buono-Core, Naples—A liquid or composition which when applied to substances of any kind will render them fire-proofs or uninflammables.

Dated 26th August, 1858.

1934. J. Coates, Lower Shadwell—Imp. in apparatus or machinery for obtaining and applying motive power.

Dated 6th September, 1858.

2012. T. Warburton, Astley, near Manchester—Imp. in machinery for preparing cotton and other fibrous materials, and for doubling yarn.

2016. R. A. Brooman, 166, Fleet-street—Imp. in printing or marking words or figures on papers, parcels, books, pages, tickets, and other articles requiring to be marked, printed, stamped, or addressed. (A com.)

Dated 7th September, 1858.

2018. J. Shanks, St. Helens, Lancashire—Imp. in the manufacture of chlorine.

2020. J. Fyfe, Greenock—Imp. in stop cocks or valves.

2024. F. W. Brind, 14, Devonshire-street, Bishopsgate—Imp. in sewing machines. (A com.)

2026. L. Pellissier and J. Puytorac, Bordeaux, France—Imp. in railway breaks.

Dated 8th September, 1858.

2028. J. R. Rostron, Edenfield, Lancashire—An improved press for packing or pressing wool and other materials.

2030. J. F. Dickson, 6, Russell-street, Litchurch, near Derby—Imp. in the construction of taps, cocks, valves, hydrants, and other apparatus for regulating the flow of water and other fluids.

2032. W. Parsons, Pratt-street, Lambeth—Imp. in apparatus to be applied to steam-boilers, in order to keep the surfaces of the tubular flues free from incrustation.

2034. W. Parsons, Pratt-street, Lambeth—Imp. in safety valves of steam boilers.

2036. R. A. Brooman, 166, Fleet-street—An imp. in the preparation of sulphate of quinine.

Dated 9th September, 1858.

2038. J. G. Newberry, Cardiff—An improved machine for tapping nuts, bolts, and screws, and other similar purposes.

2039. J. Luis, 1b, Welbeck-street, Cavendish-square—An improved life-preserver raft of buoyant mattress. (A com.)

2041. J. Rowley, Grosvenor-terrace, Camberwell—New compound material applicable as a substitute for leather and leather cloth, in the manufacture of various useful and ornamental articles.

2043. C. N. Kottula, Liverpool—Imp. in the manufacture of grease for lubricating purposes.

2044. J. Tatlow and H. Hodgkinson, Wirksworth, Derbyshire—Imp. in railway breaks.

2045. T. Timms, 1, Skelton-street, Greenwich—Imp. in bits.

2046. J. Wright, senr., and J. Wright, junr., Market-place-terrace, Caledonian-road, Islington—Imp. in machinery and apparatus used for preparing fabrics or materials to receive eyelet holes or fastenings, and fixing eyelet holes, and in fastenings for stays and other articles.

2047. W. Nimmo, Manchester—Imp. in weaving checks in power-looms.

2048. A. Baader, junr., Mittenwald, on the Isar, Bavaria—Imp. in the preparation of lubricating compounds.

2049. W. Clark, 53, Chancery-lane—Imp. in materials for dyeing and printing. (A com.)

Dated 10th September, 1858.

2051. J. Parker, Bradford—Imp. in steam boilers.

2053. J. P. Kœnig, Rue de Fleurus, Paris—Imp. in a surgical instrument called a pneumatic catheter.

2055. F. W. J. Johnson, London—Improved means of communicating between the passengers, guard, and engine-driver on railway trains.

2057. W. E. Newton, 66, Chancery-lane—An imp. in water-wheels. (A com.)

2059. W. Tosbach, Railway Works, Bristol-road, Gloucester—Imp. in pile-driving machines.

Dated 11th September, 1858.

2061. L. Hill, Port-Glasgow—Imp. in apparatus for lowering or paying out ships' chains and anchors.

2063. F. Giesbers, Great Central Gas Works, Bow-common—Imp. in the manufacture of coke.

2065. H. Page, Whitechapel—An improved crown or round glass, and apparatus for manufacturing the same.

2067. H. Wikoff, Holly-lodge, Kensington-gore—A new tonic medicine, for the cure of coughs and diseases of the chest. (A com.)

2069. L. Kaberry, and T. Mitchell, Rochdale, Lancashire—Imp. in machinery or apparatus for preparing for spinning, and spinning cotton, wool, and other fibrous materials.

Dated 13th September, 1858.

2071. W. Thomson, Manchester—Imp. in bleaching yarn, warps, or similar materials.

2073. J. B. A. Duglère, Paris—A new method of separating solids from liquids for disinfecting purposes.

2075. S. Hanbury, Birmingham Patent Iron and Brass Tube Company, Smethwick—An imp. in the manufacture of tubes of copper, brass, and other metals.

2077. J. Turner, Gresham-street—Imp. in the manufacture of hats.

Dated 14th September, 1858.

2079. C. J. Redpath, Limehouse—Imp. in ships' and other pumps.

2081. L. Vidie, Paris—Imp. in apparatus for measuring the pressure of fluids by the flexion of diaphragms.

2085. G. C. Grimes, Wandsworth—Imp. in fusees, and in the means of manufacturing fusees.

2087. A. H. J. Bastable, Belgrave Works, Ranelagh-road, Pimlico—Imp. in apparatus employed in the production of light. (A com.)

2089. Hon. W. E. Cochrane, Osnaburg-terrace, Regent's-park—An imp. in the fastening of railways.

Dated 15th September, 1858.

2091. E. Smyth, Brixton—Imp. in swimming belts and life-preservers.

2093. W. G. Taylor, Ashby de-la-Zouch, Leicestershire—Imp. in the manufacture of gloves.

Invention with Complete Specification Filed.

2098. J. R. Scartliff, Wolverhampton—An improved burglar's detector.—17th September, 1858.

WEEKLY LIST OF PATENTS SEALED.

[*From Gazette, Sept.* 24, 1858.]

September 22nd.

591. E. J. Manwaring.
600. H. L. Muller.
604. J. Rowbottom and T. Standeven.
610. C. F. Quintin.
612. J. C. Wilson.
614. H. Gerner.
621. J. F. Brinjes, junr., and H. J. Collins.
622. W. and R. Wood.
623. J. V. Hielakker.
624. A. L. Thirion.
627. W. Crook.
645. H. Doulton.
653. J. Welch.
668. W. Davis and T. Harper.
670. F. Robinson & E. Cottam.
695. F. R. & J. A. F. Tavernier.
715. S. Minton & R. H. Thomas.
792. H. Whittles, J. Schofield, E. Leach, and J. Lord.
885. M. Henry.
905. J. Maitre.
1006. J. Whitley.
1178. J. Luis.
1552. W. E. Newton.
1592. C. W. Williams.
1600. P. Fairbairn.

[*From Gazette, Sept.* 28, 1858.]

September 25th.

634. J. Young.
635. W. Robjohn.
636. F. A. Chevallier.
637. R. A. Brooman.
638. W. Moxon, J. Clayton, and S. Fearnley.
642. R. M. Butt.
647. J. and J. F. Newman.
650. J. Bushell and T. Wright.
654. J. A. V. Burg.
656. F. Bousfield.
661. J. F. Spencer.
664. J. C. Durand.
665. I. and J. Brown.
669. W. Harding.
671. J. C. Durand.
672. W. Weallens.
696. F. J. E. Oosterlinck.
700. T. Boardman & J. Allcock.
714. E. Edwards.
1593. R. Brazier.

Patents on which the Stamp Duty of £50 has been Paid.

[*From Gazette, Sept.* 24, 1858.]

September 13th.

2125. W. Pollitt and J. Eastwood.
2191. J. R., R., and J. Musgrave.

September 21st.

2122. J. Dale.

September 22nd.

2132. C. Manby and W. Piper.

[*From Gazette, Sept.* 28, 1858.]

September 23rd.

2146. J. Norbury.

September 24th.

2129. J. Beattie.
2163. R. L. Johnson.
2175. J. Beattie.
2189. F. Uchatius.

Erratum.—The following patents, numbered respectively 1979, 1981, 1983, 1985, 1987, 1959, and 1991, were inserted in last week's *Journal* as taken from the Gazette of the 17th inst., instead of from that of the 10th inst.